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WO 97/38243 A1 WO 96/21372 A1 US 4458373 A

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(54) Abstract Title

Improved cord clamp

(57) A spring loaded toggle device for gripping a cord or cords, typically shoe or boot laces, comprising two slidably connected members 1,2 adapted for reciprocal movement of the one relative to the other, a first member being provided with clip means 11 to hold in position an element or elements of the cord or cords 10 emerging from the device and either the second member (as shown) or both members each having a transverse aperture 7 extending across the direction of such relative movement through which a cord or cords may be threaded. Relative movement of the members, preferably promoted by spring loading means 3 in the one direction leads to a 'grip' relative location where the cord or cords are gripped between a rim or edge of the aperture of a second member and stop means provided by the first member, and in the other direction to a 'release' relative location where the cord or cords are released.

Figure 1

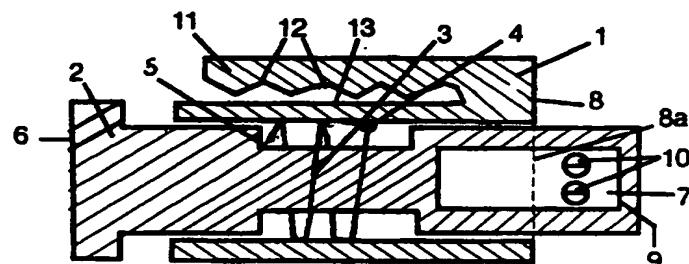
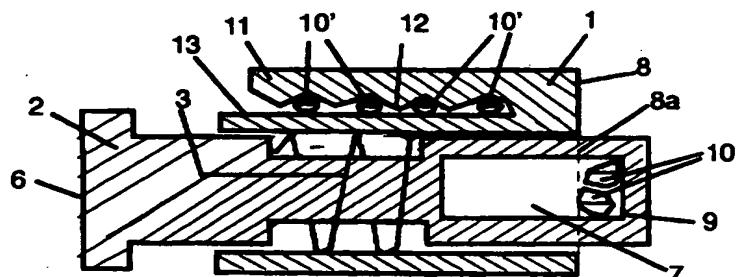


Figure 2

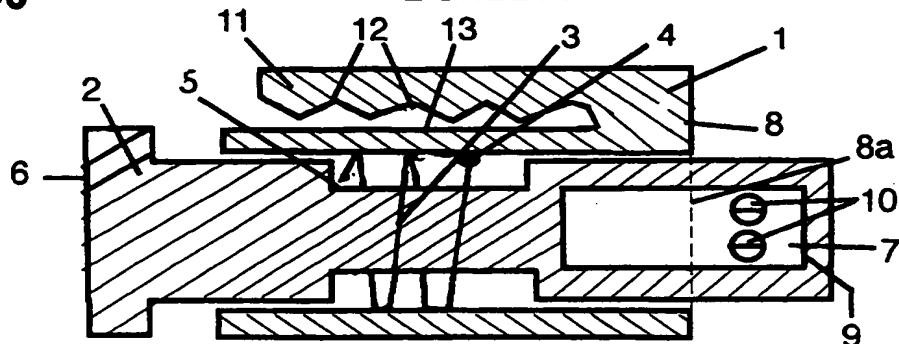
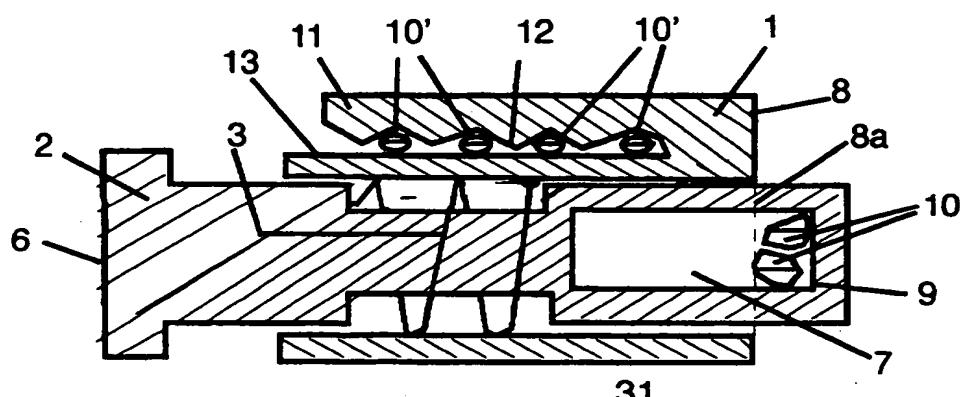
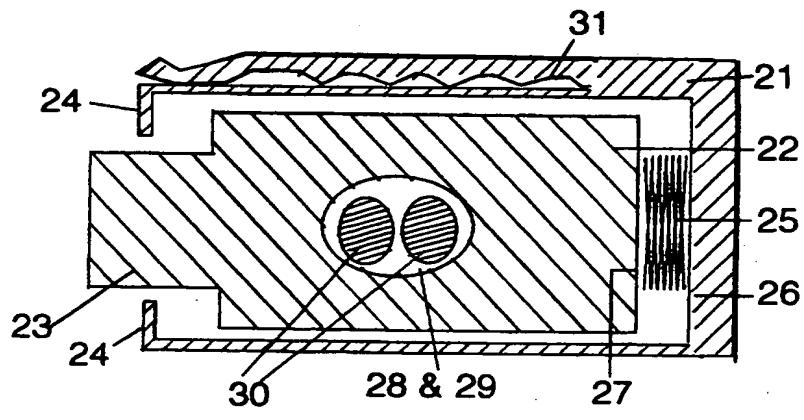
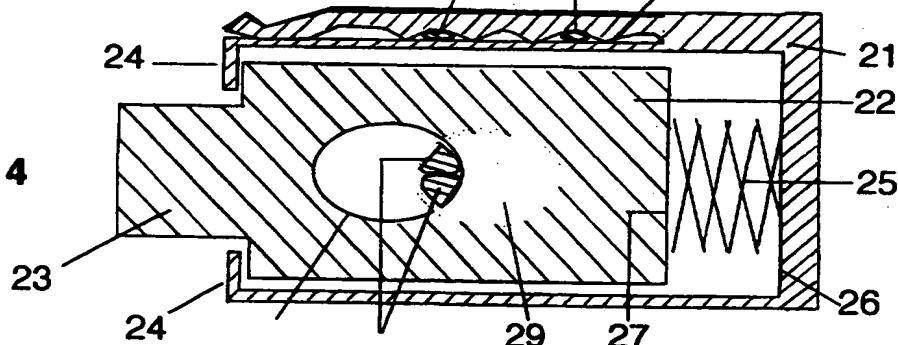


At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

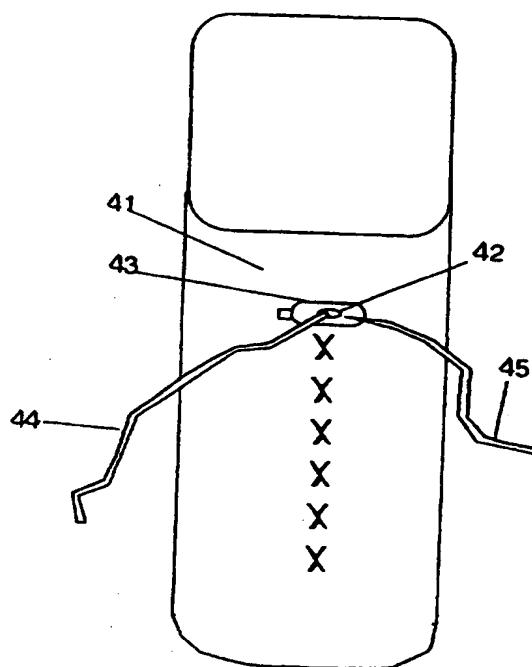
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

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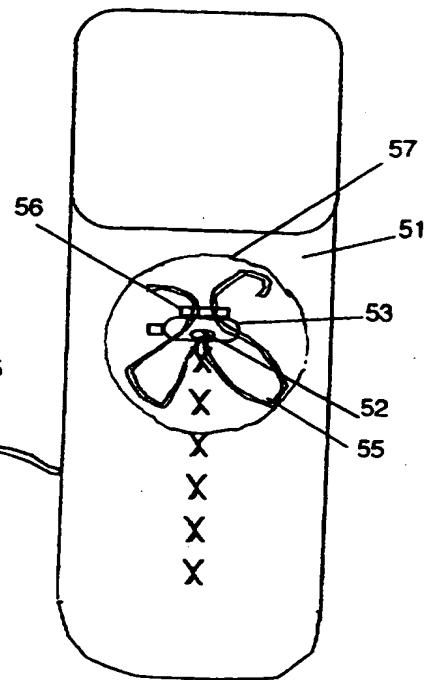
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**DRAWINGS****2 SHEETS****SHEET 1&2****Figure 1****Figure 2****Figure 3****Figure 4**

**FIGURE 5**

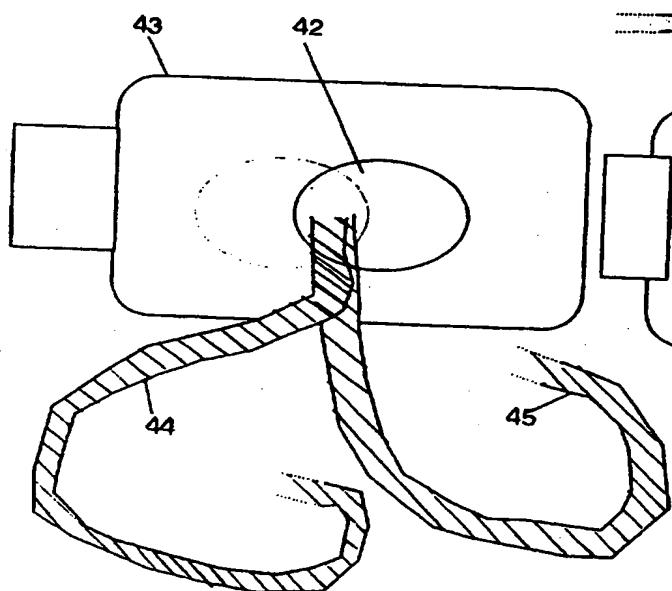


**FIGURE 6**

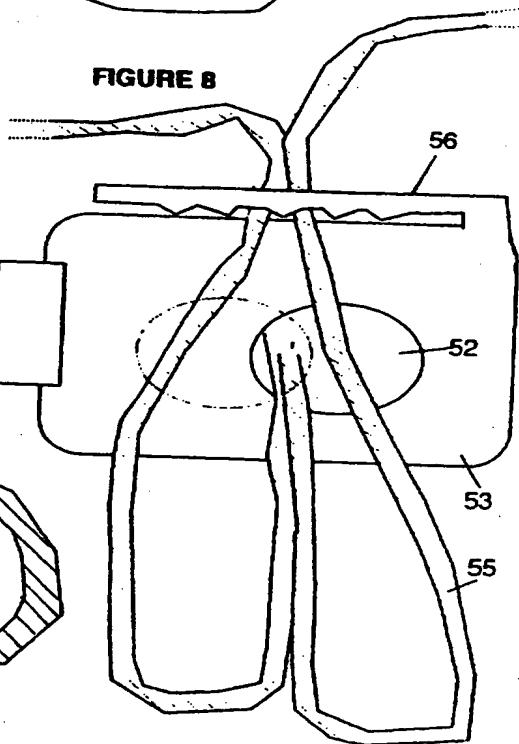


**SHEET 2/2**

**FIGURE 7**



**FIGURE 8**



## IMPROVED TOGGLE DEVICES

### Technical Field

The present invention relates to toggle devices for use as means for tying or holding flexible elongated articles such as strings, cords, strips of leather and monofilaments and the like. Toggle devices are well known and have been widely used in conjunction with clothing, in particular clothing designed for informal and/or sports wear.

### Background Art

Toggle devices are and have been used in substitution for knots, clamps and other means whereby flexible elongated articles are held in position relative to the toggle device itself and/or relative to each other and/or to some other object for example, a clothed part of a human or animal body, rucksacks or bags or the like.

For the purposes of this specification, the expression 'cord' will be used to designate and/or represent a flexible elongated article of the kind referred to above. Hence the reference to 'cord' should be taken to be a reference to each and any of the same where the context so admits. In particular, the expression 'cord' in this specification shall be taken to include bootlace and shoelace.

Despite their widespread use in conjunction with clothing and rucksacks etc, toggles have not found application in conjunction with shoelaces and bootlaces. So far as the present Applicant is aware, such use has not been proposed or mooted. Any consideration of such use immediately brings to mind the potential

risks and hazards. Thus if a toggle is used to grip boot or shoe laces, the end of the cord or cords after being drawn through the relevant apertures of the toggle that have been set to operate in the 'grip' mode would hang loose much in the same way as laces on a boot or shoe that have not been made up. The risk of tripping and other hazards that follow from wearing boots or shoes with undone laces are well known. Similar considerations can apply to the use of toggle devices in different contexts, for example in conjunction with draw-cords on human clothing or horse tack. Here again, the presence of loose cords connected at one end to the wearer of the clothing or to elements of the harness can give rise to unforeseen hazards.

It is an object of the present invention to reduce the risks and hazards caused by the use of toggle devices.

It is particularly the object of the present invention to provide a toggle device suitable for tying bootlaces and shoelaces that do not give rise to the aforesaid risks and hazards, especially in the case of children and young people. The present invention furthermore provides means for avoiding the hazards posed by loose ends of cords in general which accompany the use of toggles, e.g. on sports wear and rucksacks and the like where such loose ends, usually terminating with a knot or button, or the like, can become snagged and temporarily unbalance the wearer and can, in some sports such as rock climbing be a source of serious danger.

#### Disclosure of the Invention

According to the present invention, there is provided a toggle device for gripping a cord or cords comprising a first member and a second member

slidably connected for reciprocal movement of the one relative to the other, the second member having a transverse aperture extending across the direction of such relative movement through which a cord or cords may be threaded, such relative movement,

- (i) in the one direction being towards a 'grip' relative location in which the cord or cords so threaded are gripped between a side or rim of the aperture and stop means provided by the first member, and
- (ii) in the other direction towards a 'release' relative location in which the grip on the cord or cords is released

such device being provided with clip means adapted to hold in position against the first or second member an element or elements of the cord or cords located away from the aperture.

In a preferred embodiment of the present invention, the relative movement of the first and second member in the direction of the 'grip' relative location is promoted by spring loading means.

In one embodiment of the present invention, that part of the second member which comprises the aperture is adapted to be extended beyond one end of the first member, the second member being adapted to be withdrawn to a position where the outer side or rim of the aperture becomes located adjacent to the end of the first member which serves as a stop means so as to releasably grip the cord or cords passing through the aperture between such side or rim of the aperture and the stop means constituted by the end of the first member.

In an alternative embodiment of the present invention, apertures in the form of holes or eyes penetrate through both the first member and the second member. The second member is arranged to be in part slidably mounted within the first

member for relative reciprocal movement the one to the other, such reciprocal movement being from a first relative location where the respective holes or eyes are sufficiently in register as to enable a cord or cords to be threaded through both and a second relative location where one side or rim of the hole or eye that penetrates the second member approaches the opposing side or rim of the hole or eye of the first member so as to grip the cord or cords threaded through the respective holes or eyes. In practice, movement of the second member relative to the first member away from the said first relative location towards the gripping position as mentioned above is promoted by spring loading means. Part of the second member is adapted to project beyond and outside the first member and serves as means whereby the second member may be pushed back from the 'grip' relative location towards the said first relative location, thus releasing the grip.

In an advantageous form of such alternative embodiment of the present invention, the clip means is mounted on or is integral with the first member as described above.

By the use of such clip means, the loose cord or cords emerging from the toggle device may be restrained and held in position as if they had been tied in place in the form of a 'bow knot', i.e., a slip-knot with a single or double loop. In this way, the effective length of loose cord beyond the toggle device may be reduced by up to two thirds. The advantages resulting from the use of the arrangement of the present invention are believed to be self-evident, particularly where the invention is put to use in conjunction with childrens' lace up boots and shoes.

In another embodiment of the present invention, the toggle and clip means may be present as an integral part of the shoe or boot itself much in the manner that velcro fastening means are provided on shoes and boots today which also make use of shoe and bootlaces. The toggle device with integral clip may be affixed to or integral with the top of the boot or shoe in a position advantageous to grip the laces.

The present invention will now be described by reference to the accompanying schematic drawings in which Figure 1 represents a cross section of a toggle device which comprises a second apertured member extending partly out of a first outer member so as to enable a cord or cords to be threaded through the aperture.

Figure 2 represents the toggle device of Figure 1 in which the second member has been withdrawn in part into the first outer member so as to grip the cords passing through the aperture.

Figure 3 represents a cross sectional view of a toggle device of the invention in which the respective apertures of the first member and the second member are substantially in register and hence adapted to allow the loose ends of cords to be inserted into and readily drawn through both apertures.

Figure 4 represents a cross sectional view of the toggle device of Figure 3 wherein both the first member and the outer second member are provided with apertures the opposing sides of which serve to grip a cord or cords threaded through both apertures.

Figure 5 represents a child's shoe as it would appear if the laces were made up and held in the grip of a conventional toggle.

Figure 6 represents a child's other shoe with the laces made up and held up in the grip of a toggle device according to the present invention and safely retained by a clip in accordance with the present invention.

Figures 7 and 8 show a magnified view of the toggle and cord elements of Figures 5 and 6 respectively.

In Figure 1, 1 represents the outer member of a toggle device within which the inner member 2 is located in slidable contact with member 1. Spring means 3 anchored to member 1 at 4 bears against an abutment 5 on member 2 so as to urge the end 6 of member 2 away from member 1. At the opposite end of member 2 there is provided an aperture 7. On applying axial pressure to end 6 of member 2 whilst holding member 1 firmly in position, member 2 slides through member 1 and the opposing end of member 2 where the aperture 7 is located emerges through the outlet in end 8 of member 1. In this position, loose ends of cords may readily be inserted into and passed through aperture 7.

Referring to Figure 2, on releasing the pressure on face 6, spring 3 urges member 2 in the direction whereby that part of member 2 that includes the aperture 7 is drawn back into member 1 through the outlet in the end wall 8 of member 1. Simultaneously, the area enclosed between the side wall 9 of aperture 7 that faces the outlet and the rim 8a of the outlet itself (represented by way of a broken line) is diminished. (Such rim, of course follows the line of end wall 8.) Cords 10 - 10 which have been threaded through the aperture 7 are gripped

between aperture side 9 and the rim 8a of the inlet , see Figure 2. The outer member 1 is provided with resilient clip means 11 the operative parts or face 12 of which are located against or close to the outer side 13 of the body of member 1. In operation, loose lengths of cord 10' - 10'constituting continuations of the cords 10 - 10 gripped within the reduced area of aperture 7 are held in position between the clip 11 and the outer face 13 of member 1.

In an advantageous embodiment of the present invention, member 1 and its associated clip member 11 are formed from synthetic resin material having the appropriate measure of elasticity and resilience to ensure that the clip may be lifted off the surface 13 of member 1 sufficiently to accommodate and exert a resilient hold on the appropriate number of loose cords as required by the circumstances. Other forms of clips may be employed. For example, metal clips of the kinds commonly used on ball point pen and fountain pen caps may be used, such clips being mounted or pushed onto the member 1 as in the case of clips on the caps of ballpoint pens and fountain pens in general.

In the toggle device according to the present invention represented schematically in Figures 3 and 4, the outer body part 21 accommodates the inner member 22 a part of which 23 of reduced cross section is adapted to emerge out of the end 24 of member 21 upon being urged outwardly by a compression spring 25 held in abutment against the inner end 26 of member 21 away from outlet 24. Such spring at its other end bears against the end 27 of inner member 22 located away from the part 23 and the outlet 24. Inner member 22 is provided with a transverse aperture 28 (see Figure 4). On applying axial pressure to the protruding part 23 of member 22 against the spring 25, member 22 slides along the inside of member 21 until aperture 28 comes into register with the opposing

apertures 29 (shown schematically by a broken line in Figure 4) formed on opposite sides of member 21.

With members 21 and 22 in the relative location shown in Figure 3, the apertures 28 and 29 readily allow the loose ends of cords 30 - 30 to be inserted and drawn through. On release of the axial inward pressure on part 23 of member 22, member 22 is urged by spring 25 back to the relative position it occupied as shown in Figure 4. During the course of such movement, the cords 30 - 30 are gripped between the opposing faces of the sides or edges of apertures 28 and 29 as illustrated schematically in Figure 4.

A clip 31 is mounted onto the outer member 21 of the toggle device of Figures 3 and 4. The conventional manner of mounting and operation of clip 31 is as mentioned, mutatis mutandis, in relation to clip 11 illustrated schematically in Figures 1 and 2; and the matters set out in relation to such clip 11 of Figures 1 and 2 are repeated, mutatis mutandis, in relation to clip 31. Likewise in relation to the loose ends 30' - 30' of cords 30 - 30 represented schematically in Figures 3 and 4 and the loose ends 10' - 10' and cords 10 - 10 of Figures 1 and 2.

In Figure 5, the right foot of the child's shoe represented by 41 has its shoe laces made up and held in the apertures 42 of a toggle device 43 of the kind used hitherto in a different context, i.e. in conjunction with clothing and rucksacks etc but not boot and shoe laces.

The lengths of shoelace 44 and 45 hang loosely from the aperture 42 (see magnified view Figure 7), and, as in the case of all loose shoe laces would present a real hazard. Such hazard may be compared with the hazard posed by untied shoe laces generally. Indeed, the use of the toggle device of the prior art

would serve only to magnify the hazard, since with the toggle, the slack of the lace lengths threaded through the boot or shoe eyelets would have been taken up, thus adding to the lengths of the loose ends as compared with such lengths in the case of an un-made up boot or shoe. In the case of the situation schematically illustrated in Figure 5, the loose end 45 is liable to be stepped upon by the child's left foot encased in the left shoe 51 shown in Figure 6. As an almost inevitable result, there is a real possibility that the child will be tripped and could fall and suffer injury.

In Figure 6, each of the pair of shoelaces after having been made up emerge through the relevant apertures 52 of a toggle device 53 made according to the present invention and pass under clip 56 mounted on the toggle device 53 so that in each case, a loop is formed. The end of each lace returned under the clip to hang loose 'downstream' of the clip (see magnified view Figure 8). Alternatively, one or more loops of the lace or laces emerging from the apertures 52 may be formed 'upstream' of the clip, such loop or loops being held at one end of the toggle grip means and at the other end by the clip, with the remainder of the lace or laces 'downstream' of the clip hanging loose.

As may be observed from Figures 5 and 6, the dangerous lengths of loose shoelaces which would manifest themselves if recourse were made to the use of the prior art toggles to grip boot or shoe laces as shown in Figure 5 are, by means of the present invention, reduced by up to two thirds. By way of contrast with, for example the loose length of shoelace 45 of Figure 5 which might be trodden upon by the shoe of Figure 6, the laces of the shoe of Figure 6 are retained within the area of the circle 57 centred at aperture 52 and in close proximity to the shoe. When made up and retained as indicated above, they do not and can not reach out beyond the shoe to such an extent as to cause a

danger of tripping.

It will be seen that the invention provides means for removing the hazards that would be inherent in loose shoe laces and other loose cord ends if they were to be held in position by conventional toggle devices. Such hazards would be real. In the case of ordinary undone laces, they do in fact result in accidents as is well known to parents and school teachers. The present invention provides a novel, simple, safe and effective way for making up boot and shoe laces and securing the loose ends. This leads to peace of mind for anxious parents whose children, whether by reason of indolence, forgetfulness or their very young age fail to correctly make up and tie their shoelaces.

Older children together with adults who suffer from any of a wide range of physical handicaps and who, as a result, find it difficult or impossible to tie a safe knot on their bootlaces or shoelaces are provided by way of the present invention with means whereby the equivalent of a safe knot is readily secured by simply pushing the loose ends or a loop under the toggle clip.

## CLAIMS

I claim:

1. A toggle device for gripping a cord or cords as defined herein comprising a first member and a second member slidably connected for reciprocal movement of the one relative to the other, the second member having a transverse aperture extending across the direction of such relative movement through which a cord or cords may be threaded, such relative movement,
  - (i) in the one direction being towards a 'grip' relative location in which the cord or cords so threaded are gripped between a side or rim of the aperture and stop means provided by the first member, and
  - (ii) in the other direction towards a 'release' relative location in which the grip on the cord or cords is releasedsuch device being provided with clip means adapted to hold in position against the first or second member an element or elements of the cord or cords located away from the aperture.
2. A toggle device as claimed in claim 1 in which the relative movement of the first and second member in the direction of the 'grip' relative location is promoted by spring loading means.
3. A toggle device as claimed in either claim 1 or claim 2 in which that part of the second member which comprises the aperture is adapted to be extended beyond one end of the first member, the second member being adapted to be withdrawn to a position where the outer side or rim of the aperture becomes located adjacent to the end of the first member which serves as a stop means so

as to releasably grip the cord or cords passing through the aperture between the said side or rim of the aperture and the stop means constituted by the end of the first member.

4. A toggle device as claimed in claim 1 or claim 2 in which apertures in the form of holes or eyes penetrate through both a first outer member and a second inner member, the second member being arranged to be at least in part slidably mounted within the first member for relative reciprocal movement the one to the other, such reciprocal movement being from a first 'release' relative location where the respective holes or eyes are sufficiently in register as to enable a cord or cords to be threaded through both and a second 'grip' relative location where one side or rim of the hole or eye that penetrates the second member approaches the opposing side or rim of the hole or eye that penetrates the first member so as to grip the cord or cords threaded through the respective holes or eyes.

5. A toggle device as claimed in claim 4 in which part of the second member is adapted to project beyond and outside the first member so as to provide means whereby the second member may be pushed back from the 'grip' relative location towards the said first 'release' relative location.

6. A toggle device as claimed in any of the claims 3 to 5 inclusive in which the clip means is mounted on or is integral with the first member.

7. A toggle device substantially as described by reference to Figures 1 and 2 hereof.
8. A toggle device substantially as described by reference to Figures 3 and 4 hereof.
9. A toggle device as claimed in any of the preceding claims when used in conjunction with shoe laces or boot laces.
10. A combination of a toggle device as claimed in any preceding claim and a shoe or boot in which the toggle device is mounted on the shoe or boot as the case may be in a position advantageous for facilitating the gripping of the shoe laces or boot laces.
11. A method of tying shoe laces or boot laces which comprises passing the laces through the aperture in the second member of a toggle device as claimed in claim 2 or any dependent claim when the first member and the second member are located respectively the one in relation to the other in the 'release' relative location and permitting relative movement of the first member in relation to the second member to the 'grip' relative location under the influence of spring loading means.
12. A method of securing shoe laces or boot laces substantially as described by reference to Figures 6 and 8



14.

Application No: GB 9824708.3  
Claims searched: 1-6,9-11

Examiner: Philip Silvie  
Date of search: 20 May 1999

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): E2A (AGB, AGKFG)

Int Cl (Ed.6): A43C (7/00, 7/08); F16G (11/10)

Other: Online: EPODOC, WPI, PAJ

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	WO 97/38243 A1 (ARONSON) see fig.1	1,2,4-6
X	WO 96/21372 A1 (HOLMBERG) see page 5, last paragraph	1,2,4-6,10,11
A	US 4 458 373 A (MASLOW) see fig.1	1,10,11

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